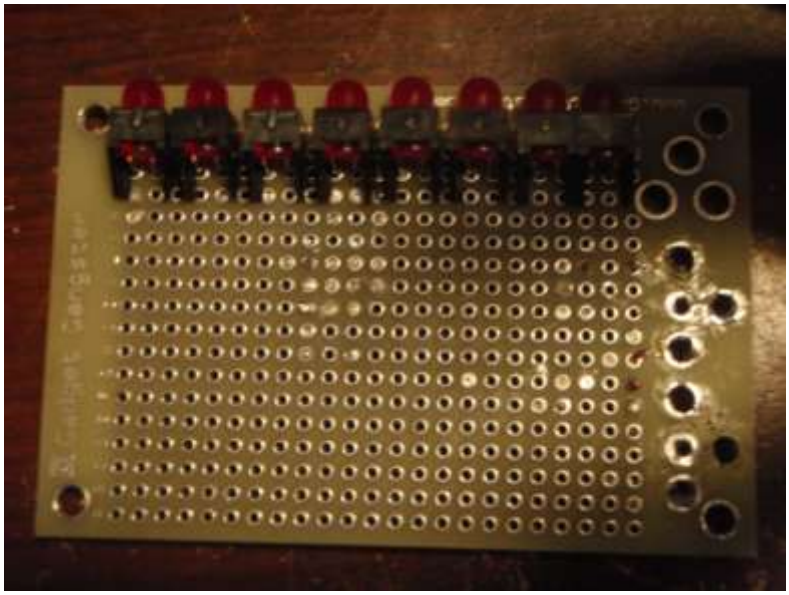
How to make the Spinning Light Display

The Spinning light display uses a motor to spin the board at high speed while pulsing the lights to make patterns in the air as it zooms around. It is easy to build, easy to use, and fun to show off! It also has a header so that Professional designers can update the software on the chip to make it display text or different patterns. I loaded on all the patterns it would hold, so have fun!

Here's how to build it.

Step 1:

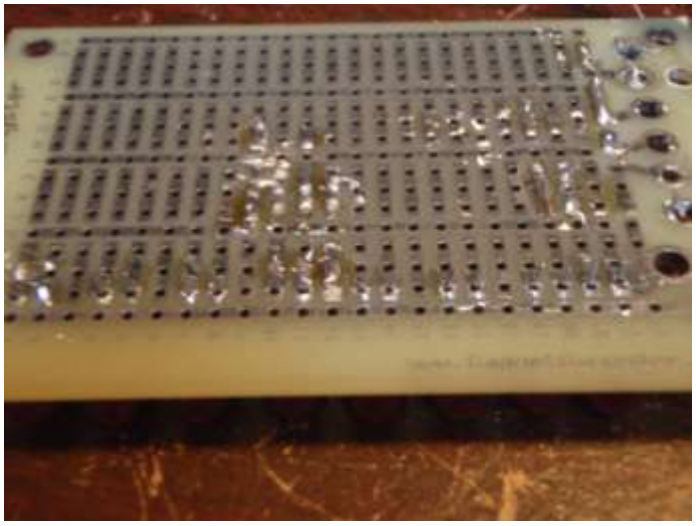
Lay out the LEDs on the board as shown in the picture. Yours will not have the holders like mine do. They will also be green. Just bend the leads down at a 90 degree angle and set them in starting at the left side of the board. Set each of the LEDs with the bent leads into the topmost holes spacing all of them 2 holes apart except for the last one. Because of space restriction space it 1 hole apart from the 2nd to last LED.



Step 2:

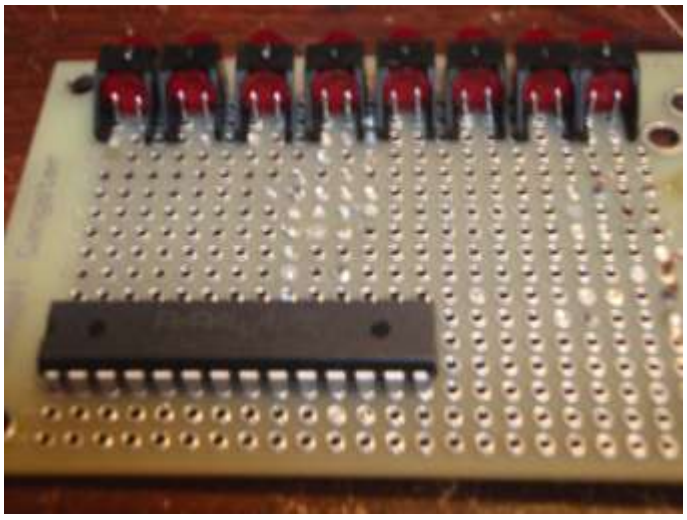
Solder down the LEDs. Be careful that you do not set the iron on each one too long or it could potentially damage the LED. Remember that yours are not red, they are green so don't let that confuse you. If the LEDs start to fall out or bend at the wrong angle then to keep them from falling out or to keep from risking breaking the leads by bending them back put some electrical tape across the top of them to temporarily hold them in place while you solder them. Do not use too much solder and try to keep the solder from flowing into the holes that the LEDs are not inserted into. Also it is

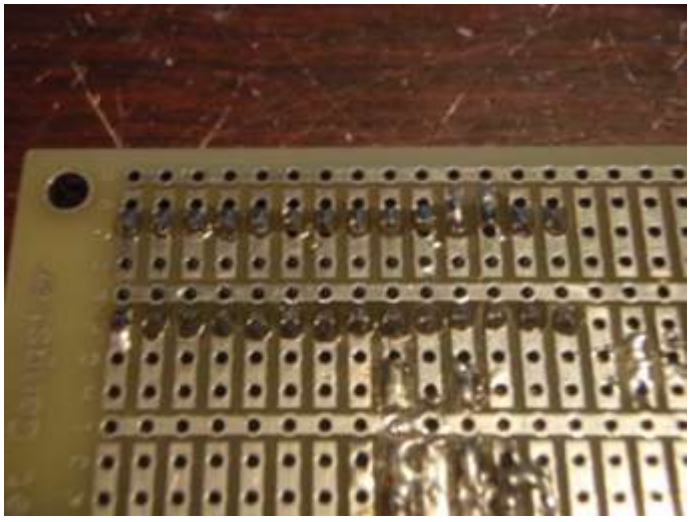
important to make sure that the solder does not spill over and join with the neighboring trace. It should look like the picture below. (This is a "recycled" board so it has some other unwanted solder on it. Yours shouldn't have that.)



Step 3:

The next step is to get the chip (or in your case the chip socket) and solder it down. You can solder the chip directly to the board but is highly not recommended. I only soldered directly to the board because I did not have a socket. Remember that the chip socket goes UNDER the chip. DO NOT solder the socket down with the chip in it! That defeats one of the purposes of the socket!

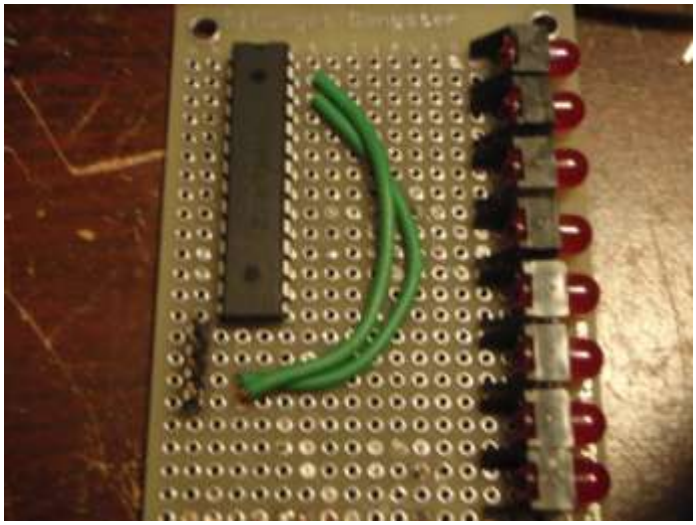
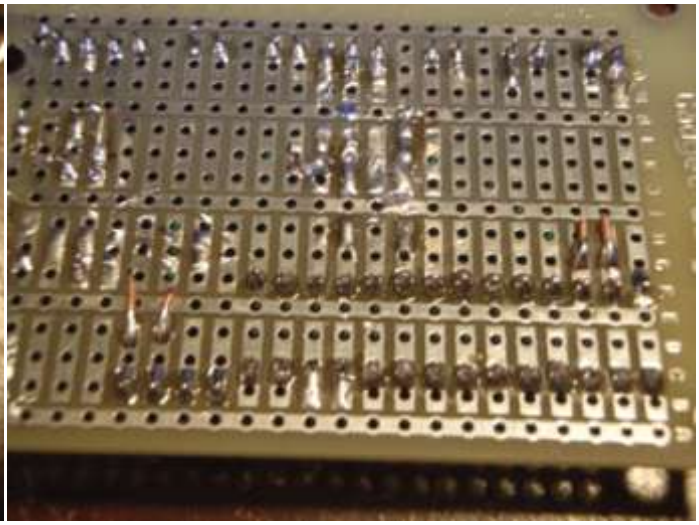




Notice how the solder is in a cone shape facing up. This is how your solder should look. Also try NOT to cover the adjoined holes with solder like I did on 2 of the pins. If you do not wish to program the SX yourself to modify it in the future, skip steps 4 and 5. Your board will be less cluttered this way.

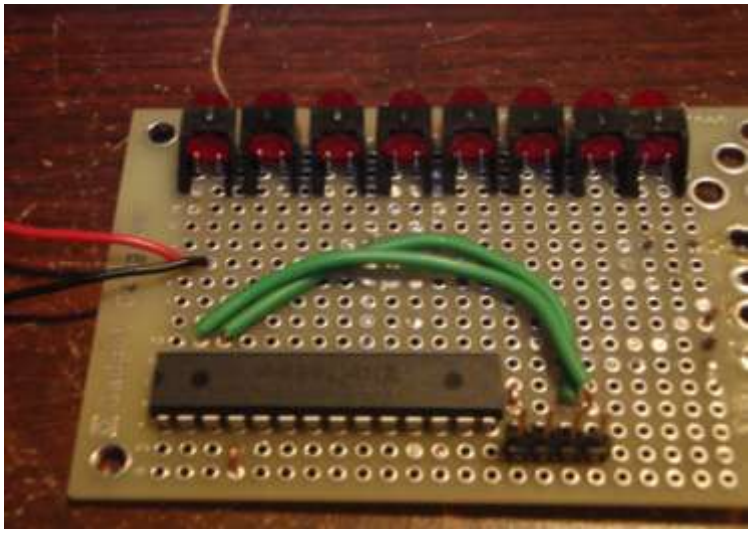
Step 4:

You will now insert the Programming header. Insert the header right below the last pin on the SX one column out from the left side. Cut and strip 2 wires to length and solder them down as shown. The first wire will be connected to the 2nd pin down on the right side and then connected to the bottom pin on the header. The next wire will be connected to the 3rd pin down on the chip and then connected to the 2nd pin up on the header. Solder them down.

Step 5:

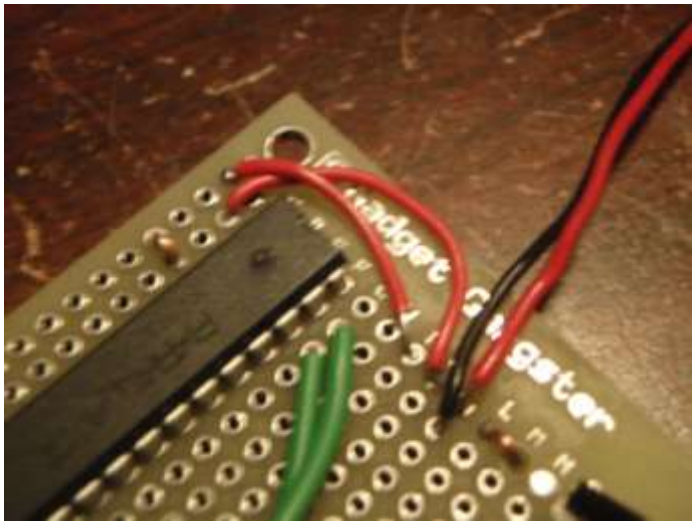
Strip ½ inch off your piece of wire and bend it 180 degrees. Insert it from the top of the header into the power main onto the back of the board as shown.



Step 6: (See picture above) Insert the power lines as shown above by cutting an inch off your wire piece and cutting what remains of it in half and soldering it to lines K1 and K2. (Once again, yours will be a different color)

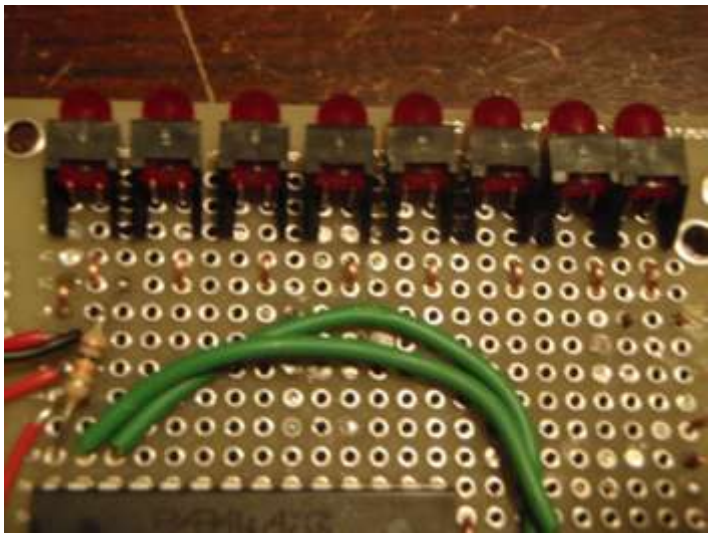
Step 7:

Insert the power lines to the SX chip using the 2 brown wires supplied. (Mine are red) Take the first one and hook one end to J1 and the other end to B2. Take the second one and hook one end to I1 and the other end to A1. Take the remaining inch of your wire piece and cut into 3 pieces. Strip them entirely and bend them like you did in step 6. Insert them at L1 : M1, I2 : J2, and A4 : B4. Solder down all your connections.



Step 8:

Insert your pre-cut jumpers at the following locations. All the locations are across M & N. Here are the numbers: 2, 5, 8, 10, 12, 14, 16, and 18. Solder down your connections from the top and snip off the bottom leads hanging down. Do this with all your components if you have not done it already.

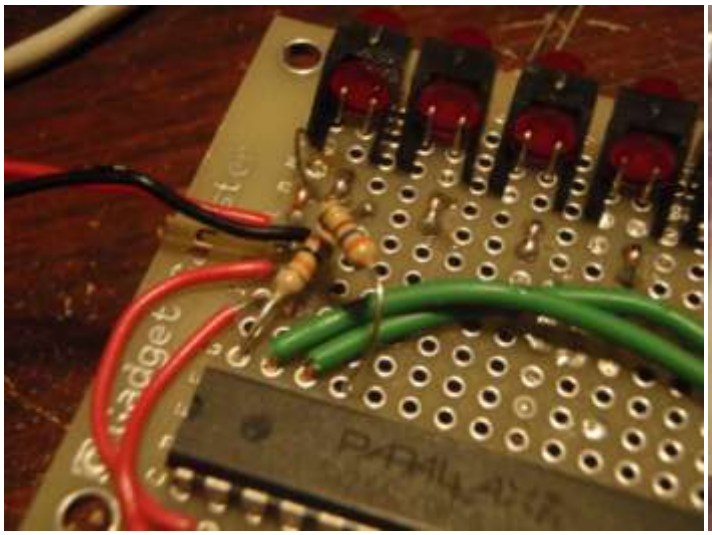


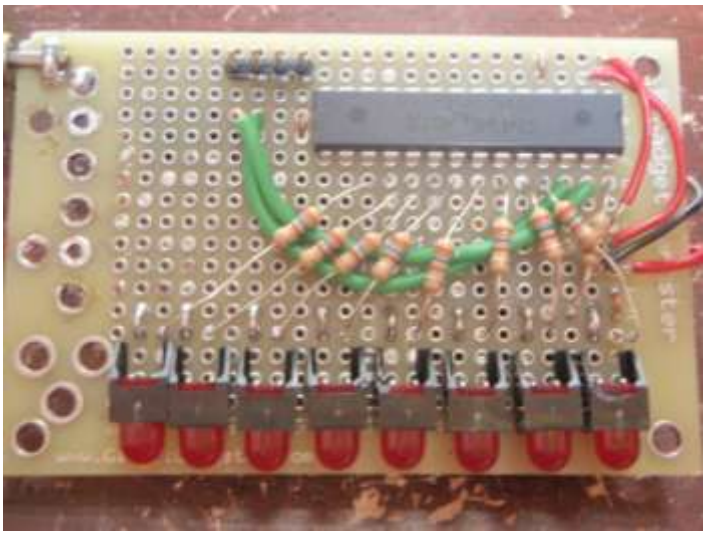
Step 9:

Insert the 10K resistor. The 10K is the one with the color scheme brown-black-orange. Insert it between G1 and M3. Make sure that the open leads do NOT touch anything else that is exposed.

Step 10:

Insert all the resistors to the LEDs. They are 470 ohms, or yellow-violet-brown. Take all 8 of them and start inserting them as shown. I was using a stronger LED at the time so my colors will be different because I had to use a weaker resistor.





Here is the location numbers for the resistors: G4 to N1, G5 to N4, G6 to N7, G7 to N10, G8 to N13, G9 to N16, G10 to N19, and G11 to N21. Make sure that the leads are not touching anything else that is exposed, and then solder them down.

Step 11:

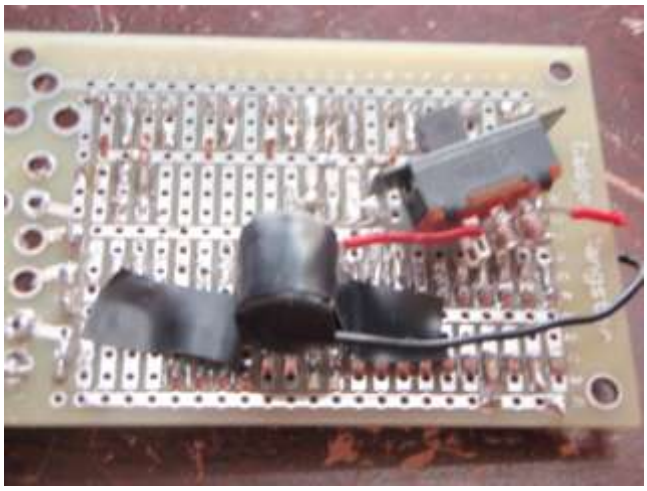
Take the batteries included (they should be coin cell) and some electrical tape and tape them together, making sure that they are NOT touching the sides that look alike. Tape them by stacking them and wrapping around, leaving the ends exposed. Then take the wire attached to K1 and cut it. Strip both ends. (Of the piece you cut off and the piece still attached)

Step 12:

Next, take the switch and solder the two cut wires to it. The piece you cut off to the middle, the piece still attached to one of the sides. You may have to bend the stripped piece of wire around the lead of the switch so it stays still while you solder it.

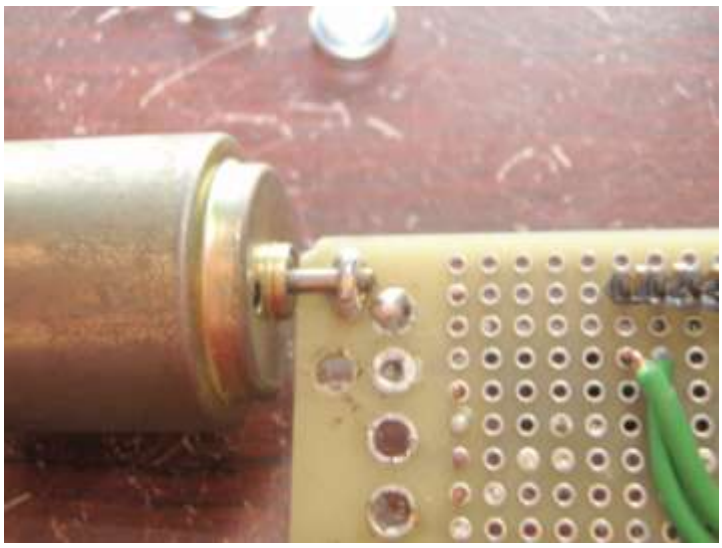
Step 13:

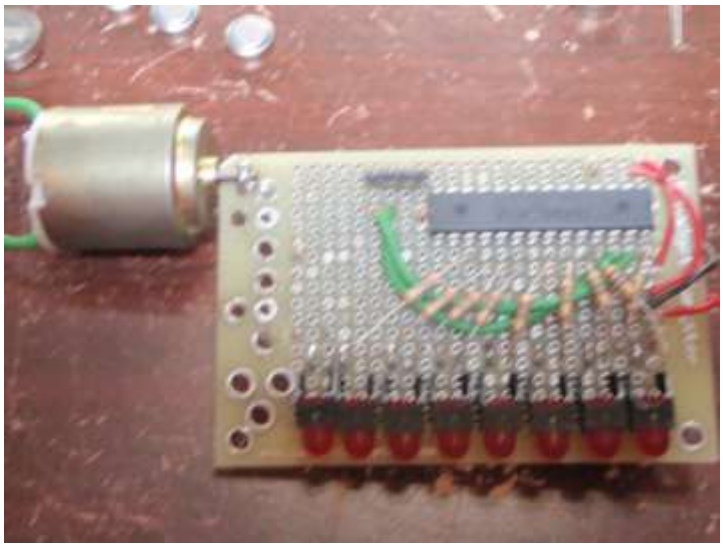
Take the wire now soldered to the switch and the wire attached to K2 and tape them to the battery. Tape K2 to the (–) side of the battery pack (the unlabeled side) and the one connected to the center probe of the switch to the (+) side of the battery pack (the flat side). Tape around the battery so that it tapes the wires to the ends of the pack. Make sure that they are touching. You can try to solder them to the ends, but I could not get the solder to stick. Insert the IC and flip on the switch and you should see the lights pulsing rapidly. If they do not, check your wiring. The problem is most likely in your battery and power switch connection. If you cannot get a reliable connection, stick a piece of foil at the end. I used a switch I had laying around, so it will (once again) not look like yours. I used a piece of tape to strap the pack to the board.



Step 14:

We are almost done! Take the motor in your kit and sand the axle by running the blades of your wire cutters along it or by using sandpaper. This is optional, but it may help it stick. Next, set the motor axle on top of the end hole (top left in the picture below) and put a ball of solder on each side. Then slowly feed the solder to the iron as you creep up the side of the motor, heating the solder ball as it grows with the addition of solder. Then when you get it up the to get it to go down the other side and join the solder ball adjoined to the opposite side of the hole it is setting on. Look at the instructional pictures below.





Step 15:

Solder the wires of the 9V battery clip to the motor. I have included 2 extra resistors that you can use or you can not use to limit the current flow to the motor. The motor is 3V with a max of 9V so you may want to use at least one. I have not tested this, so you will have to choose. If it does not get enough speed, then unsolder it and solder the wire directly to the motor lead.

That's it! We're done! Now turn it on and watch it go!!!!